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PHOTOGRAPHIC INTERPRETATION REPORT

ANALYSIS OF RAILHEAD AND STORAGE AREAS AT SOVIET SINGLE-SILO ICBM COMPLEXES

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AUGUST 1967
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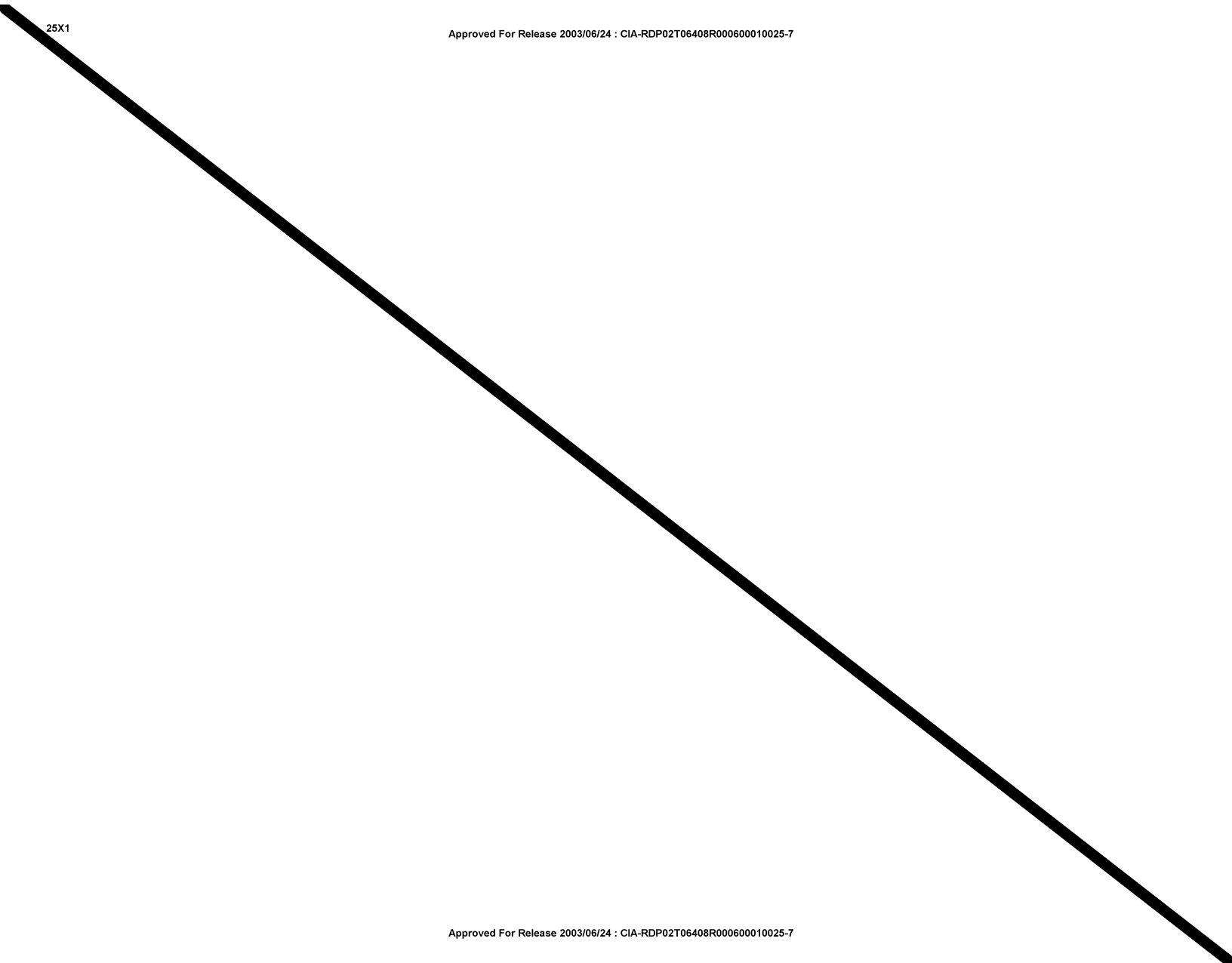

PHOTOGRAPHIC INTERPRETATION REPORT

ANALYSIS OF RAILHEAD AND STORAGE AREAS AT SOVIET SINGLE-SILO ICBM COMPLEXES

AUGUST 1967

NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

PREFACE

This report, prepared in response to GMAIC Requirement 31-67, represents a detailed analysis of the railhead and storage area at each of the Soviet Type IIIC and IIID ICBM complexes, with specific reference to launch site construction and construction timing. The function and facilities of the railhead and storage areas were assessed and, in each instance, an effort was made to identify items used in site construction, and to determine materiel stockpile levels for purposes of forecasting future deployment.

Analysis was restricted by the interpretability of photography available over each complex. Weather conditions, heavy snow cover, and the small scale precluded identification of specific items on [redacted] 25X1
[redacted] photography was interpretable for certain determinations but coverage, especially over railhead and storage areas, is very limited. Suitable coverage of some complexes is almost nil; however assumptions can be made from photography of similar facilities at other complexes. All available [redacted] photography, 25X1
through [redacted] was used in the analysis. 25X1

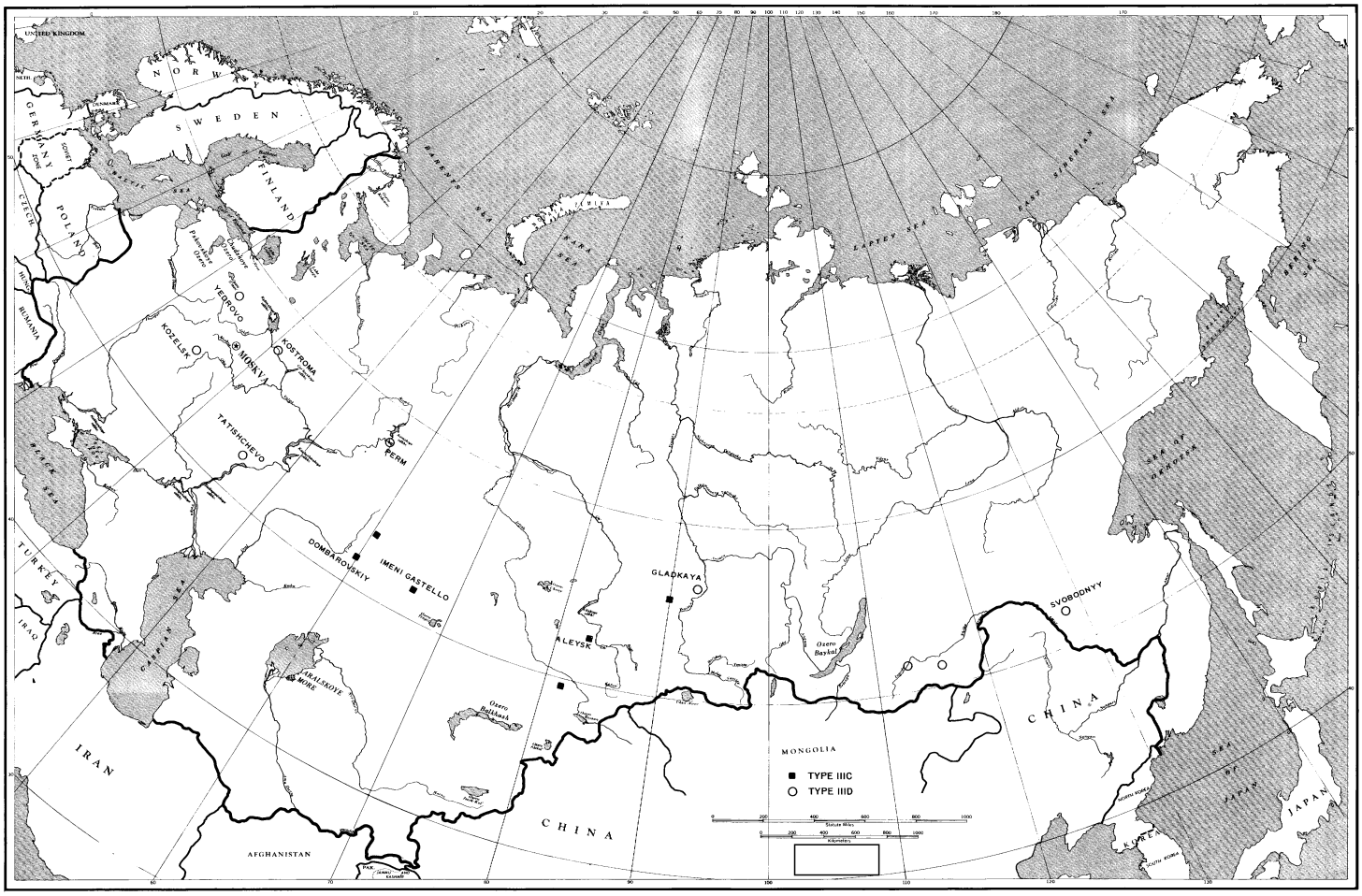

FIGURE 1. LOCATIONS OF SOVIET TYPE IIIC AND IIID ICBM COMPLEXES.

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INTRODUCTION

The railhead and storage area is an integral part of the complex support facility at each ICBM complex. During construction of the individual launch sites and the permanent portions of the complex support facility, it functions as the receiving, storage, and distribution facility for materials and supplies. Unlike the rail-to-road transfer point, which is a permanent facility, the railhead and storage area diminishes in activity once the construction program is completed at a complex. The physical characteristics of the railhead and storage area, such as size, layout, and location, vary considerably within each complex support facility. The locations of Soviet Type IIIC and IIID ICBM complexes are given in Figure 1. The railhead and storage area, and its associated open storage yards at the complex support facility of the Zhangiz-Tobe ICBM Complex are shown in Figure 2.

Each railhead and storage area contains warehouse-type buildings, some with transloading docks, and large areas for open storage. Multiple rail sidings connect with the main spur serving the rail-to-road transfer point or the complex support facility. The sidings, many of which are equal in length, often form a candelabra pattern. Roads with wide-radius turns throughout the area provide access to the complex main roads.

With the exception of the Tatishchevo Complex, the railhead and storage area at each of the Type IIID complexes contains a concrete prefabrication plant. These plants probably provide all batch mixes required for general construction purposes, and an undetermined amount of prefabricated materials for silo construction. 1/ Concrete production facilities at some railhead and storage areas include multiple batch plants, cement drying kilns, prefabrication buildings, and drying pits. Sand and gravel are delivered by rail, with conveyer systems feeding the batch plants. At Tatishchevo, all prefabricated materials are shipped by rail into the railhead and storage area. A possible concrete batch plant located southeast of the railhead and storage area, near the branch switch for the rail spur, may furnish some of the construction materials for the complex.

The railhead and storage area at each of the 6 Type IIIC ICBM complexes has a batch plant to provide concrete for construction of the complex. No prefabrication plants or cement drying kilns have been identified in association with these batch plants; however, limited concrete prefabrication is possible. Delivery of supplies and prefabricated materials by rail at the complex support facility of the Uzhur ICBM Complex is shown in Figure 3. The allocation of prefabricated materials for individual launch sites is accomplished at a distribution point associated with the railhead and storage area. The distribution point usually contains rail sidings, with roadways accessible to the complex main roads.

Large heavy duty cranes of various types are available for handling materials in the storage areas and distribution points. There are usually large rail-mounted gantries, and traveling and hammerhead cranes in the storage areas of the candelabra sidings and the distribution point. Mobile cranes and lifting equipment are observed throughout the area, outside the operating range of the rail-mounted cranes.

TYPE IIIC ICBM COMPLEXES

CONSTRUCTION ITEMS

The Type IIIC complexes, containing only one type of launch site, all require like construction materials -- a number of which have been identified in the railhead and storage areas during the various construction stages. One of the most evident and easily identified items is a fuel storage tank with a capacity of approximately 14,000 US gallons. A total of 29 of these tanks is used at each launch group; 11 tanks are installed adjacent to the control bunker, and 3 tanks at each of the 6 launch sites. There were 27 fuel tanks in the railhead and storage area at the Kartaly ICBM Complex (Figure 4) in [redacted] but only 13 tanks were observed in [redacted] One launch group was in a midstage of construction at Kartaly in [redacted] and one group in an early stage. Since these tanks are normally seen in place at launch sites in a midstage of construction, it can be concluded that those remaining in the railhead and storage areas are scheduled for launch sites identified at an earlier date.

The hollow prefabricated blocks observed at the railhead and storage areas (Figure 5), and at the launch sites (Figure 6), have been identified as components of the pier supports for the silo door rails behind the silo headworks (Figure 7). No definite determination has been made as to total number used, or if this size block is used exclusively for the rail piers. Some doubt exists as to the number used in the piers, since a single block frequently appears on the opposite side of the silo excavation. In [redacted] Launch Site 23 at the Zhangiz-Tobe ICBM Complex was in an early stage of construction and contained 32 of these blocks next to the silo excavation (Figure 8). Launch Sites 18 and 19 at the Dombarovskiy ICBM Complex, both in the midstage of construction, contained 11 and 19 of these blocks, respectively, in [redacted] The evidence indicates that the blocks are brought to the launch site during the early stage, and are utilized as the site progresses to mid and late stages of construction.

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The silo liner arrives in 6 sections on the rectangular mound at Type IIIC launch sites. It is assembled on a

cradle at the mound and is not placed in the silo until the site is nearing the late stage of construction. No liner sections have been identified in the railhead and storage areas.

Other prefabricated materials have been observed in the railhead and storage areas and at the launch sites but, since methods of stacking preclude definitive identification, the quantities and uses of these materials in launch site construction have not been determined.

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MATERIEL STOCKPILE LEVELS

Analysis of the railhead and storage areas at the 6 Type IIIC ICBM complexes indicates that the identifiable inventory consists of materials for launch sites in various stages of construction. All materials necessary for the construction of each site are not brought into the railhead and storage area at one time, but appear to be programmed over a period of time relevant to requirements for the various stages of construction. The lack of timely photographic coverage over the railhead and storage areas precludes establishment of a norm for stockpile levels, or a regulated flow of materials.

TYPE IIID ICBM COMPLEXES

25X1

CONSTRUCTION ITEMS

Many of the items used in construction of the launch silos have been identified in the railhead and storage areas at Type IIID complexes, but specific use of the items in site construction cannot always be determined. The most evident item is the [redacted] silo headworks block; however, stacking methods in the railhead and storage areas preclude determination of the exact number in storage. Mensural data indicates that there are probably 15 of these wedge-shaped blocks, plus 1 for the appendage, in the top tier of the silo headworks and 16 or 17 blocks in the bottom tier. These blocks have been observed most prominently in the railhead and storage area at the Olovyannaya ICBM Complex (Figure 9), and at various launch sites under construction.

25X1

Prefabricated concrete blocks for supporting the silo door rails have been identified in groups of 14, as required at each launch site. These blocks have been in evidence in the distribution point of the railhead and storage area at the Olovyannaya Complex (Figure 9).

A square prefabricated block, peculiar to control sites, has also been identified in the distribution point at the Olovyannaya Complex, and at the various control sites. [redacted] 2 of these blocks were observed at Launch Site 25 and, in [redacted] 1 or more blocks were possibly installed along an open trench at Launch Site 46. No determination has been made as to their use, other than they are significant to the construction of the control facility and may be conduit sections.

The prefabricated concrete cubicles used in construction of the rectangular mound patterns at Type IIID launch silos 2/ have been identified in the railhead and storage area at the Drovyanaya ICBM Complex (Figure 10). The 4 cubicles used at each site are not discernible unless the round opening on top is visible. The cubicles have been identified at only a few other railhead and storage areas and launch sites.

Other components, such as concrete arches, entranceway blocks for earth-covered buildings, concrete conduit, and fenceposts, are identifiable in the railhead and storage areas and at the launch sites. No silo doors have been observed in the railhead and storage areas but, [redacted] [redacted] 10 door shells were seen at Launch Site 46 (control) at the Olovyannaya Complex and 7 door shells (probably being assembled) were observed at the rail-to-road transfer point at the Yedrovo Complex.

MATERIEL STOCKPILE LEVELS

Analysis of the railhead and storage areas at Type IIID complexes reveals that no "normal" materiel stockpile levels can be determined. All photography examined indicates that the stockpile of materials never exceeds the requirements for a group of 10 launch sites. The best available photography of railhead and storage areas, primarily those at the Drovyanaya, Olovyannaya, Perm, and Svobodnyy Complexes, indicates that stockpiles may be less than the requirement for construction of a launch group. At the Tatishchevo Complex, stockpiled material has been observed for a distance of approximately 1.0 nm along both sides of the rail spur approaching the railhead and storage area; however, the quality of the photography was such that meaningful levels could not be determined.

It is possible, in retrospect, to establish a relationship between materiel levels and deployment rates at specific complexes. For example, in [redacted] the railhead and storage area at the Perm Complex did not appear to contain sufficient materials to support the start of a new launch group, and no new starts have been observed to date. At the Olovyannaya Complex, in [redacted] the railhead and storage area showed evidence of materials for approximately 7 launch sites; between [redacted] [redacted] 7 new launch sites were observed. Six of the 7 sites were observed in [redacted] and were the last of the new starts observed at the complex through [redacted] Evidence in [redacted] however, revealed that the prefabrication plant in the railhead and storage area at Olovyannaya is producing silo headworks materials and components indicative of the start of a new launch group. The large inventory of materials and the generally high level of activity in the railhead and storage area at the Svobodnyy Complex are also indicative of continued deployment. The concrete prefabrication plant at the Drovyanaya Complex is in a production status but, in [redacted] it was evident that insufficient materials were available in the railhead and storage area to support the start of a sixth launch group; no additional materials have been observed.

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The limited supply of materials and the general level of activity in the railhead and storage area at the Kostroma Complex do not exemplify a support role similar to that at other Type IIID complexes. No positive identification has been made of a concrete prefabrication plant associated with the existing batch plants at Kostroma.

CONCLUSIONS

The following conclusions can be drawn from the analysis of photography currently available on railhead and storage areas at Soviet single-silo ICBM complexes:

- Future deployment of Type IIIC and IIID launch sites cannot be forecast beyond one additional group, and this determination cannot be made for all new groups.

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- Production at the concrete prefabrication plant in the complex support facility at Type IIID complexes and activity in the open storage yards of the railhead and storage area at both Type IIIC and IIID complexes are evidence of new launch group deployment.

- At all Type IIID complexes, except Tatishchevo, prefabricated materials are supplied to the distribution points in the railhead and storage areas from concrete prefabrication plants in the complex support facility. At Tatishchevo, and at all Type IIIC complexes, prefabricated materials are brought in by rail.

- Many of the construction components are identifiable in the railhead and storage areas but, because of stacking methods, quantities are undeterminable.

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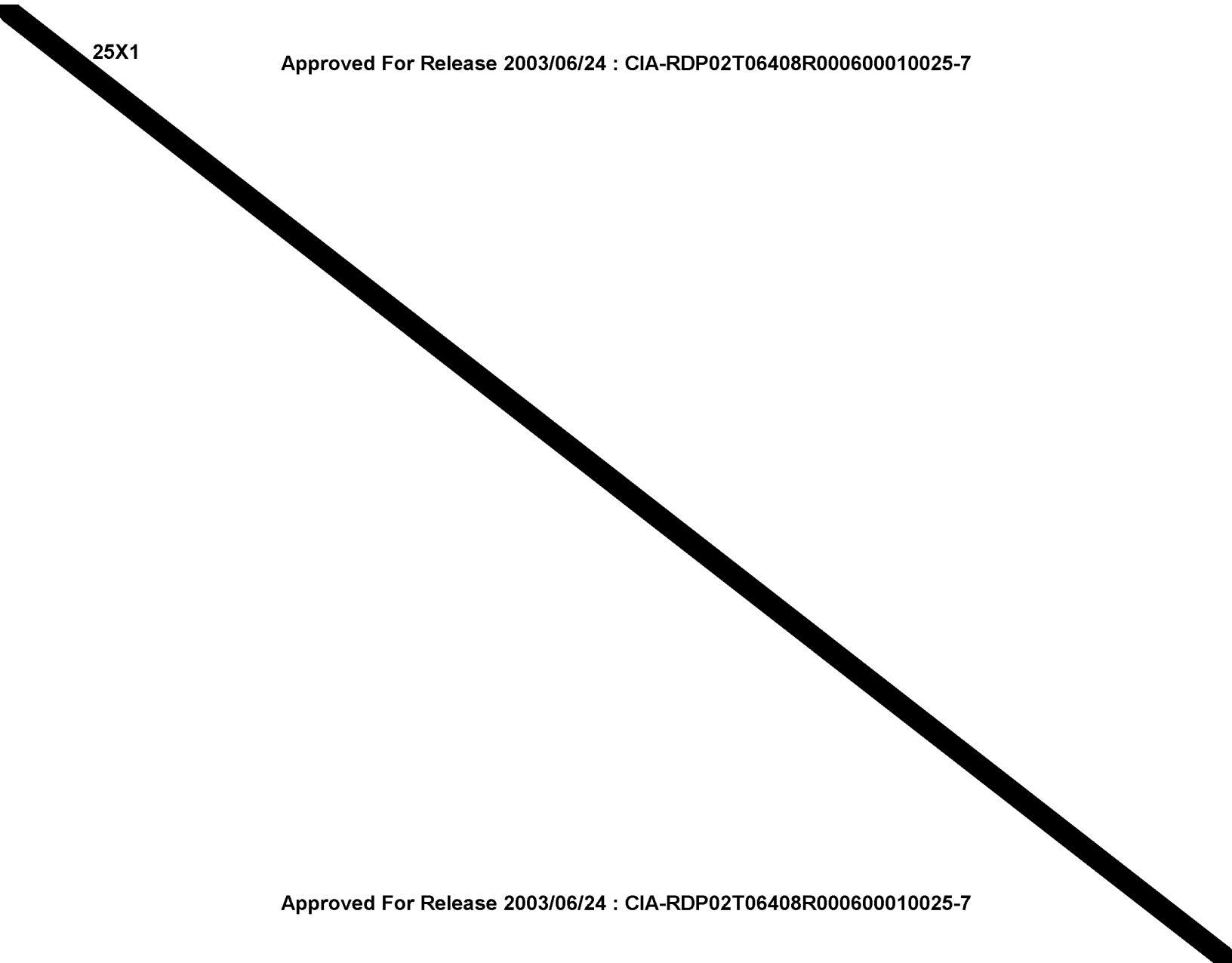
FIGURE 2. RAILHEAD AND STORAGE AREA, COMPLEX SUPPORT FACILITY, ZHANGIZ-TOBE ICBM COMPLEX.



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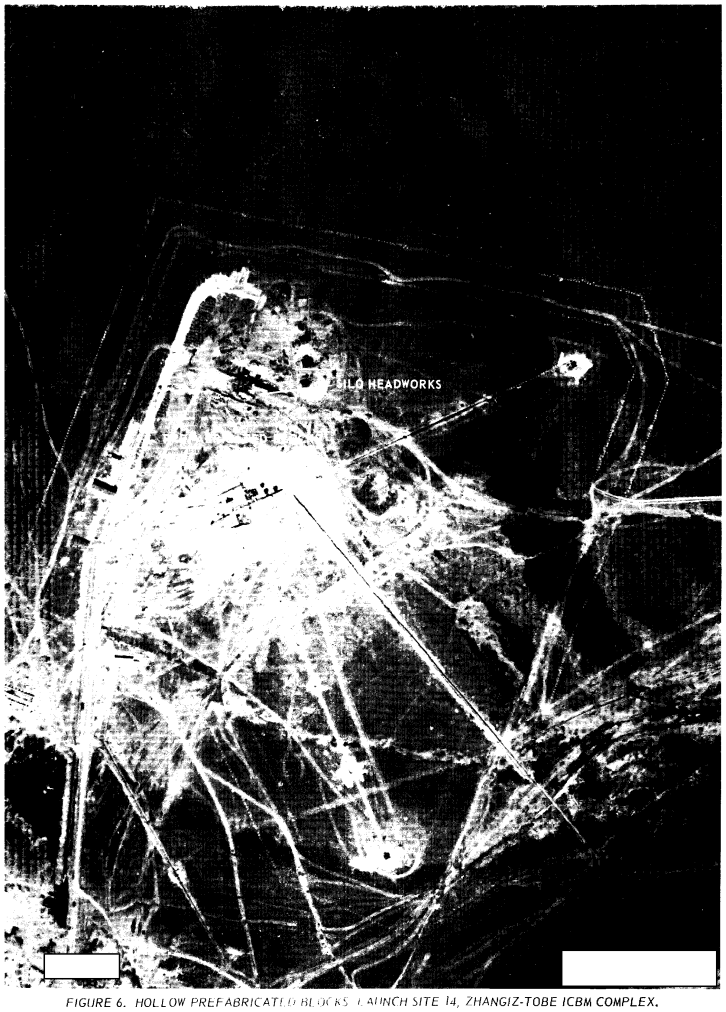

FIGURE 6. HOLLOW PREFABRICATED BLOCKS, LAUNCH SITE 14, ZHANGIZ-TOBE ICBM COMPLEX.

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[redacted]

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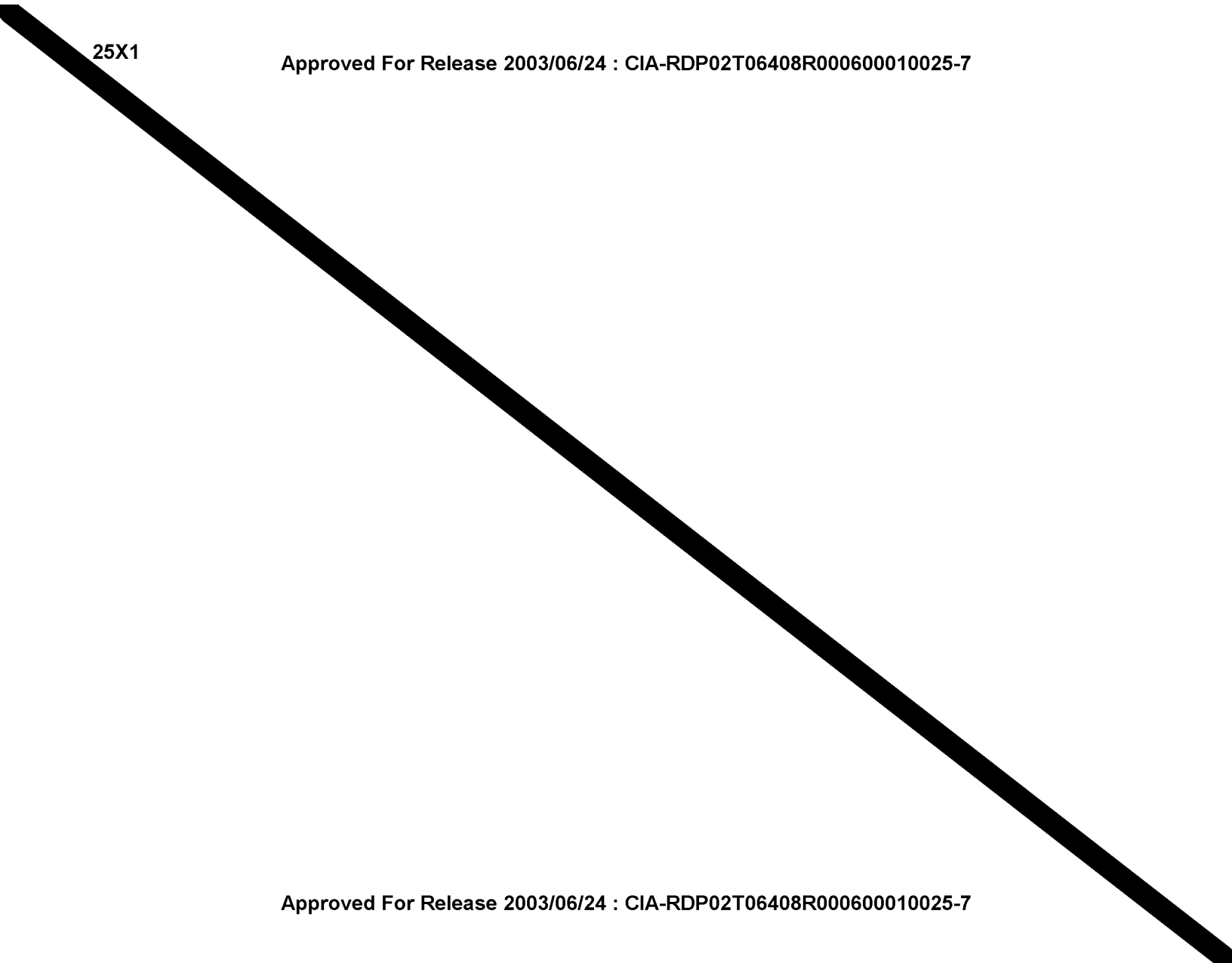

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FIGURE 9. RAILHEAD AND STORAGE AREA, OLOVYANNAYA ICBM COMPLEX.

FIGURE 10. RAILHEAD AND STORAGE AREA, DROVYANAYA ICBM COMPLEX.

REFERENCES

25X1 [redacted]

DOCUMENTS

1. NPIC. *Construction Techniques and Procedures Associated With The Type IIID ICBM Launch Silo,* Oct 66 (TOP SECRET
2. NPIC. *Possible Guidance-Associated Facilities and Geodetic Monuments at Type IIID Launch Sites,* Jan 67 (TOP SECRE

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REQUIREMENT

GMAIC. 31-67

NPIC PROJECT

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